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- Expedited Examining Procedure -
Examining Group 1752**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Lilia P. Burleva, et al

**METHOD FOR CHEMICAL
SENSITIZATION OF SILVER
HALIDE FOR
PHOTOTHERMOGRAPHIC USE**

Serial No. 10/731,462

Filed 09 December 2003

Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

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Group Art Unit: 1752

Examiner: Chea, Thorl

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10/25/2005
Date

PRE-APPEAL BRIEF REQUEST FOR REVIEW

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Photothermographic materials are constantly being redesigned to increase photospeed without a significant increase in fog (Dmin) or a loss in Dmax.

Applicants' claimed invention meets this need for increased photospeed by preparing a photothermographic emulsion and material using a specified order of steps and specific diphenylphosphine sulfide compounds of Structure (PS) that is recited in Claim 1:

- A) providing a dispersion of preformed photosensitive silver halide grains and a non-photosensitive source of reducible silver ions,
- B) providing a diphenylphosphine sulfide compound of Structure PS in association with the dispersion of step A,
- C) chemically sensitizing the preformed photosensitive silver halide grains by decomposing the diphenylphosphine sulfide on or around the preformed photosensitive silver halide grains in an oxidative environment, and
- D) converting some of the reducible silver ions to photosensitive silver halide grains.

Claims 1-13, 15-17, and 19-23 have been rejected as unpatentable over U.S. Patent 5,891,615 (Winslow et al.) taken with U.S. Patents 3,895,951 (Riester et al.), 6,274,297 (Uytterhoeven et al.), and 3,457,075 (Morgan et al.).

Applicants respectfully submit that the rejection is in error.

(1) Riester et al. is non-analogous art and is improperly combined with Winslow et al., Uytterhoeven et al, and Morgan et al.

Riester et al. is directed to photographic materials containing a silver halide, which materials are processed after exposure, using wet photographic processing solutions (e.g. Col. 17, lines 30-44). Nothing in Riester et al. hints of "dry-processed" photothermographic materials.

Riester et al. is also not in the field of Applicants' endeavor nor is it reasonably pertinent to the particular problem with which the Applicants are concerned, *In re Oetiker* 24 U.S.P.Q.2d 1443, 1445 (Fed. Cir. 1992) and *In re Deminski* 230 U.S.P.Q. 313 (Fed. Cir. 1986). Also, Riester et al. would not logically have commended itself to Applicants' attention in considering a photospeed problem, *Wang Laboratories Inv. v. Toshiba Corp.* 26 U.S.P.Q.2d 1767 (Fed. Cir. 1993).

The imaging arts have long recognized the differences between these two imaging systems and the unpredictable utility of photographic components in photothermographic materials because of the very different imaging chemistries, conditions,

and retention or lack of retention of imaging chemistries in the imaged materials. The differences between photothermography and photography are outlined on pages 2-4 of the present application and references cited therein. These differences have necessitated separate classification in the USPTO as well as other patent searching databases.

Applicants have found chemical sensitizers that when oxidatively decomposed solve the problem of increasing photospeed in photothermographic materials without a significant increase in fog (D_{min}) or a loss in D_{max} . In contrast, Riester et al. is directed to phosphine sulfides as “supersensitizers” to enhance the performance of known spectral sensitizing dyes in photographic materials. The two problems are very different and the two imaging systems are different. One skilled in the photothermographic art would have no reason to consult photographic art relating to spectral sensitization to find chemical sensitizers for increased photospeed in photothermographic materials.

Since Riester et al. is directed to photographic emulsions, there is no discussion of the formation of *in-situ* photosensitive silver halide grains. Such grains are formed and used only in photothermographic emulsions since an organic silver salt must be present. The Final Rejection fails to address this critical deficiency in Riester et al.

While it might be “obvious to try” such chemical components in photothermographic materials, without any reasonable expectation of success, merely trying the compounds in this manner does not render such use unpatentable. Without motivation in the art in general or in Riester et al., it is not reasonably pertinent to the present invention to increase photospeed in photothermographic emulsions.

Therefore, Riester et al. fails the test for “analogous” art—it is not in Applicants’ field of endeavor and it is not reasonably pertinent to the particular problem addressed by Applicants’ claimed invention.

(2) Even if Riester et al. could be combined with Winslow et al., Uytterhoeven et al., and Morgan et al., the combined teaching fails to provide a *prima facie* basis for unpatentability of the claimed invention.

The sulfur-containing compounds described in Winslow et al. for chemical sensitization do not include the diphenylphosphine sulfides used in the present invention. Riester et al., Uytterhoeven et al., and Morgan et al. do not supply the missing teaching.

Riester et al. is directed to the use of a wide variety of phosphine sulfides in photographic materials but only teaches their use as “supersensitizers” for spectral sensitizing dyes (this is not chemical sensitization). They are used to enhance the performance of known spectral sensitizing dyes, and more conventional compounds are

then used as chemical sensitizers (see Col. 1, lines 37-48; and Col. 15, line 69 to Col. 16, line 26). Example 1 demonstrates this using a merocyanine spectral sensitizer (Col. 17, lines 3-5). The phosphine sulfide compound was found to increase sensitivity (which is not photospeed) of the spectral sensitizing dye (Table I). There is no suggestion of chemical sensitization by any type of compound in Example 1.

Riester et al. also teaches that the phosphine sulfides can be added at any time in the preparation of a silver halide photographic emulsion (Col. 15, lines 16-24). There is no critical addition sequence or conditions for any type of emulsion let alone a photothermographic emulsion. This is in stark contrast to the present invention and Winslow et al. where sulfur-containing compounds must be added at a specific time and in an oxidizing environment to chemically sensitize the preformed silver halide grains. This is additional evidence that Riester et al. is not teaching the use of these compounds as chemical sensitizers.

One skilled in the art following the combined teaching of Riester et al. and Winslow et al. would recognize that Riester et al. teaches the use of numerous conventional chemical sensitizers (Col. 15, line 69 to Col. 16, line 26). However, such chemical sensitizers are not useful in the method of Winslow et al. (i.e. they cannot be oxidized). Winslow et al. teaches away from the use of these conventional compounds (Col. 9, lines 10-24), and there is nothing in Riester et al. to suggest that the phosphine sulfides should replace the conventional "chemical" sensitizers since they are used only to enhance the sensitivity of the "spectral" sensitizers.

Morgan et al. fails to teach the advantages of using both preformed silver halide grains and *in-situ* silver halide formation. Morgan et al. actually teaches away from the use of both types of silver halide because the *in-situ* silver halide is said to enhance imaging capability "far beyond" that achieved by the "simple addition of preformed silver halide" (Col. 4, lines 8-13). As a result of this teaching, one skilled in the art would not be directed by Morgan et al. to do anything approaching Applicants' claimed method.

Further, Morgan et al. does not suggest chemical sensitization for photothermographic emulsions at any time, whether before or after formation of *in-situ* photosensitive silver halide grains. Since Morgan et al. is limited to *in-situ* photosensitive silver halide grains, it fails to teach the use of chemical sensitization of a mixture of both preformed (*ex-situ*) and *in-situ* photosensitive silver halide grains.

Uytterhoeven et al. is cited for the proposition that it teaches a mixture of *ex-situ* and *in-situ* silver halide grains in order to increase the sensitivity of photothermographic materials. However, Uytterhoeven et al. neglects to teach chemical sensitization

of either type of silver halide grains by any process. Uytterhoeven et al. adds nothing in to that of Winslow et al.

Thus, the combination of the four references fails to teach or suggest the presently claimed invention.

(3) Applicants have provided a showing of unexpected results.

Example 2 of the present application (pages 78-79) provides comparative data that is evidence of unexpected results and patentability over the teaching in the art. Several photothermographic materials were prepared, imaged, and evaluated using the procedures described in Example 1 (pages 73-76). Control Example 2-1 contained no chemical sensitizer. Comparative Example 2-2 was prepared using a merocyanine dye as a chemical sensitizer according to Winslow et al. Inventive Examples 2-3 and 2-4 were prepared using two diphenylphosphine sulfide compounds according to the present invention.

The sensitometric results obtained from these photothermographic materials are shown in TABLE II (page 79). The photospeeds (measured at two places on the Density vs. log E curve, SP-2 and SP-3) were unexpectedly increased using the diphenylphosphine sulfides of the present invention compared to both the Control and Comparative Example 2-2 (for SP-2, the increase was 12% and 22%, and for SP-3, the increase was 8% and 18%).

A previously submitted **Rule 132 Declaration** by Co-Applicant Simpson describes Example 8 from co-pending and commonly assigned U.S. Serial No.10/731,251 (filed 12/9/03). While the invention described and claimed in that copending application is directed to the use of a combination of Au(III) compounds and diphenylphosphine sulfides as chemical sensitizers in photothermographic materials, the Example 8 comparative results are equally cogent as evidence for patentability of the present invention. The processes of making photothermographic materials and the materials made there from described in the Declaration were essentially the same as those used in present invention. The GOLD compounds tested were used at the same concentration so their effects cancel.

The Example 8 results demonstrate that not just any phosphine sulfide will provide an increase in photospeed. The use of a diphenylphosphine sulfide compound provided significantly better photospeed and image contrast in photothermographic materials compared to the use of the triphenylphosphine sulfide (Compound 1) used Examples 1, 3, 4, 5, 6, 7, and 8 of Riester et al. that is outside the scope of the present invention. Although Riester et al. tested a few other compounds, Compound 1 is clearly the preferred phosphine sulfide from its predominance in the examples.

Thus, Applicants have demonstrated that the use of diphenylphosphine sulfides according to the present invention provides unexpected results compared to the method of Winslow et al. or the compounds of Riester et al.

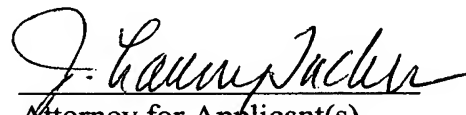
For all of these reasons, the rejection of the claims over Winslow et al., Riester et al., Uytterhoeven et al., and Morgan et al. is in error and should be withdrawn.

Claims 14 and 18 were rejected as unpatentable over Winslow et al., taken with Riester et al., Uytterhoeven et al., and Morgan et al., and further in view of U.S. Patent 6,440,649 (Simpson et al.). This rejection is in error for the same reasons stated above. Nothing in Simpson et al. overcomes the deficiencies in the other four references.

Claims 1-23 were rejected as being unpatentable under the judicially created doctrine of obviousness-type double patenting over Claims 1-19 of Winslow et al. in view of Morgan et al., Uytterhoeven et al., and Riester et al. The double patenting rejection is faulty for the same reasons stated above. The claimed invention is equally patentable over the teaching with the claims in Winslow et al. as well as with the teaching in its specification.

It is believed that the foregoing is a complete response to the Final Rejection on all issues and that the present application should be passed to issue. A Notice of Appeal is being filed herewith.

Respectfully submitted,



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